

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Canceled)

2. (Previously Presented) A radio digital signal receiver for receiving a broadcast signal obtained by multiplexing a plurality of kinds of polyphase PSK-modulating signals having respective different numbers of phases, the receiver comprising:

means for individually detecting a received C/N and a decoding error rate of a received digital signal;

decision means for estimating and deciding the quality inherent phase noise characteristics of a local oscillator in an outdoor unit connected to a receiving terminal of the radio digital signal receiver on the basis of foresight information for the relationship among three values of a received C/N, a decoding error rate and a phase noise and the detected received C/N and decoding error rate, in a burst symbol reception mode for regenerating a carrier from only a polyphase PSK-modulating signal having the minimum number of phases of the received plurality of kinds of polyphase PSK-modulating signals the detected decoding error rate being one detected when the received C/N exceeds a first predetermined threshold value; where if the detected decoding error rate is equal to or less than a second predetermined threshold, the phase noise characteristics are decided to be higher quality, while if the detected decoding error rate exceeds the second predetermined threshold, the phase noise characteristics are decided to be lower quality;

means for selecting and switching a carrier regenerative loop characteristic on the basis of the quality of the estimated inherent phase noise characteristics of the local

oscillator in the outdoor unit, wherein the means for selecting and switching a carrier regenerative loop characteristic operates so that (i) if it is decided by the decision means that the phase noise characteristics are higher quality, a carrier regenerative loop characteristic corresponding to a critical CNR by a phase noise having a rapid variation property is selected and (ii) if it is decided by the decision means that the phase noise characteristics are lower quality, a carrier regenerative loop characteristic corresponding to a critical CNR by a phase noise having a gentle variation property is selected; and

means for shifting the operation of the receiver from the burst symbol reception mode to a continuation reception mode after selecting and switching the carrier regenerative loop characteristic, the continuation reception mode allowing a carrier to be regenerated one by another from respective ones of the received plurality of kinds of polyphase PSK-modulating signals.

3. (Previously Presented) The radio digital receiver according to claim 2, wherein said means for setting the loop characteristics sets a filter factor of a loop filter inserted into the carrier regenerative loop.

4. (Previously Presented) The radio digital signal receiver according to claim 3, wherein said polyphase PSK-modulating signal is a BPSK-modulating signal.

5. (Previously Presented) The radio digital signal receiver according to claim 3, wherein said decoding error rate to be detected is the bit error rate of a predetermined polyphase PSK-modulating signal.

6. (Previously Presented) A radio digital signal receiver for receiving a broadcast signal obtained by multiplexing a plurality of kinds of polyphase PSK-modulating signals having respective different numbers of phases, the receiver

comprising a down-converter having a local oscillator, a carrier regenerator, a demodulator for demodulating a received modulated wave signal and a decoder for taking a digital signal from the demodulated signal, further comprising:

means for detecting a received C/N of the received modulated wave on the basis of said demodulated signal;

means for detecting a decoding error rate of the digital signal at a time when the detected C/N exceeds a first predetermined threshold value;

wherein the decoding error rate to be detected is a bit error rate of a predetermined polyphase PSK-modulating signal of the received plurality of kinds of polyphase PSK-modulating signals, which is demodulated in a burst symbol reception mode for regenerating a carrier from only a polyphase PSK-modulating signal having the minimum number of phases of the plurality of kinds of polyphase PSK-modulating signals;

decision means for estimating and deciding the quality of inherent phase noise characteristics of the local oscillator on the basis of foresight information for the relationship among three values of a received C/N, a decoding error rate and an inherent phase noise of the local oscillator in the down-converter and the magnitude of said detected decoding error rate, where if the detected decoding error rate is equal to or less than a second predetermined threshold, the phase noise characteristics are decided to be higher quality, while if the detected decoding error rate exceeds the second predetermined threshold, the phase noise characteristics are decided to be lower quality; and

means for selecting and switching a carrier regenerative loop characteristic for the carrier regenerator on the basis of the quality of the estimated phase noise characteristics of the local oscillator, the means for selecting and switching the carrier regenerative loop characteristic operates so that (i) if it is decided by the decision means that the phase noise characteristics are higher quality, a carrier regenerative loop characteristic corresponding to a critical CNR by a phase noise having a rapid

variation property is selected and (ii) if it is decided by the decision means that the phase noise characteristics are lower quality, a carrier regenerative loop characteristic corresponding to a critical CNR by a phase noise having a gentle variation property is selected; and

means for shifting the operation of the receiver from the burst symbol reception mode to a continuation reception mode after selecting and switching the carrier regenerative loop characteristic, the continuation reception mode allowing a carrier to be regenerated one by another from respective ones of the received plurality of kinds of polyphase PSK-modulating signals.

7. (Canceled)

8. (Currently Amended) The radio digital signal receiver according to claim 6 or ~~claim 7~~, wherein means for changing said loop characteristics changes the filter factor of a loop filter inserted into the carrier regenerative loop.

9. (Currently Amended) The radio digital signal receiver according to claim ~~[[7]]~~ 6, wherein said polyphase PSK-modulating signal having the minimum number of phases is a BPSK-modulating signal.

10. (Currently Amended) The radio digital signal receiver according to claim ~~[[7]]~~ 6, wherein said predetermined polyphase PSK-modulating signal is an 8PSK-modulating signal.

11. (Previously Presented) A signal processing method used in a radio digital signal receiver for receiving a broadcast signal obtained by multiplexing a plurality of kinds of polyphase PSK-modulating signals having respective different numbers of phases and for down-converting a received modulation signal by using a down-

converter, demodulating the received modulated signal by using a regenerated carrier and decoding a digital signal from a demodulated signal, said method comprising the steps of:

- detecting a received C/N of said received modulated signal on the basis of said demodulated signal;

- determining whether said detected received C/N exceeds a first predetermined threshold value;

- when said received C/N is determined to exceed said predetermined threshold value,

- detecting a decoding error rate of said digital signal, wherein the decoding error rate to be detected is a bit error rate of a predetermined polyphase PSK-modulating signal of the received plurality of kinds of polyphase PSK-modulating signals, which is demodulated in a burst symbol reception mode for regenerating a carrier from only a polyphase PSK-modulating signal having the minimum number of phases of the plurality of kinds of polyphase PSK-modulating signals;

- comparing the magnitude of the detected decoding error rate with a predetermined threshold value, where if the detected decoding error rate is equal to or less than the predetermined threshold, the phase noise characteristics of the down-converter are decided to be higher quality, while if the detected decoding error rate exceeds the predetermined threshold, the phase noise characteristics of the down-converter are decided to be lower quality, the decision being made on the basis of foresight information for the relationship among three values of a received C/N, a decoding error rate and an inherent phase noise of a local oscillator in the down-converter, and

- selecting and switching the characteristic of the carrier regenerative loop on the basis of the decided quality of the phase noise of the down-converter, wherein the step for selecting and switching the carrier regenerative loop characteristics is performed so that (i) if a detected decoding error rate is equal to or less than a second predetermined

threshold value it is decided that the phase noise characteristics are higher quality, a carrier regenerative loop characteristic corresponding to a critical CNR by a phase noise having a rapid variation property is selected, and (ii) if it is decided that the phase noise characteristics are lower quality, a carrier regenerative loop characteristic corresponding to a critical CNR by a phase noise having a gentle variation property is selected; and

shifting the operation of the receiver from the burst symbol reception mode to a continuation reception mode after selecting and switching the carrier regenerative loop characteristic, the continuation reception mode allowing a carrier to be regenerated one by another from respective ones of the received plurality of kinds of polyphase PSK-modulating signals.

12. (Previously Presented) The radio digital signal receiver according to claim 5, wherein said predetermined polyphase PSK-modulating signal is an 8PSK-modulating signal.